

REMARKS

The Examiner is thanked for the thorough examination of this application and the allowance of claims 8-11, 13, 22-25, and 27 contain allowable subject matter. In view of the foregoing amendments, Applicant respectfully submits that all pending claims are in condition for allowance.

This is a full and timely response to the outstanding Action mailed October 12, 2005. Upon entry of the amendments in this response, claims 1-3 5, 7-11, 13, 15-17, 19, 21-25, 27 and 29-34 remain pending. In particular, Applicant has amended claims 1 and 15 and has added claims 29-34. In the amended claims 1 and 15, the limitation "the fourth lightly doped region is shallower than the first doped region" has been added. No new matter is added to the application by this amendment. Reconsideration and allowance of the application and presently pending claims are respectfully requested.

Rejections under 35 U.S.C. 103

The Office Action indicates that claims 1-3, 5, 7, 15-17, 19 and 21 stand rejected under 35 U.S.C 103(a) as allegedly unpatentable over Smayling et al. (US Pat. 5,275,961) in view of Beak et al. (US Pat. 6,465,845). Applicant respectfully traverses the rejections.

With respect to Smayling, Smayling discloses an n-channel vertical DMOS, in which an n+ region 640 is surrounded by an n- region 636, such that the n+ region 640 is isolated from a back gate contact region 644 by the n- region 636 (See FIG. 16g). Note that the n- region 636 overlaps or surrounds the n+ region 640, thus the depth of the n- region 636 is deeper than the n+ region 640.

With respect to Beak, Beak discloses a method for fabricating an EDMOSFET, in which n type impurity ions are heavily injected into a p type Dwell region 34 to form a source region 36. Next, p type impurity ions are injected into a portion adjoining to the source region 36 to form a p+ type body contact region 38 (See col. 5, lines 35-41 and Fig. 3G). Note that there is not a lightly doped region of n type adjacent to the n type source region 36. That is, it is impossible to exist a lightly doped region having a depth shallower than the source region 36.

Turning now to the amended claims, independent claim 1 recites:

1. A high voltage device comprising:
 - a substrate;
 - first and second wells respectively of a first type and a second type in the substrate;
 - a gate formed on a junction between the first and second wells, without a field oxide between the gate and the first and second wells;
 - first and second doped regions both of the second type, respectively formed in the first and second wells and on both sides of the gate;
 - a third doped region of the first type in the first well and adjacent to the first doped region; and
 - a fourth lightly doped region of the second type adjacent to the first doped region and beneath the gate, wherein the fourth lightly doped region is shallower than the first doped region.*

(Emphasis Added).

Additionally, claim 15 recites:

15. A method for manufacturing a high voltage device, comprising the steps of:
 - providing a substrate;
 - forming first and second wells respectively of a first type and a second type in the substrate;
 - forming a gate on a junction between the first and second wells, without a field oxide formed between the gate and the first and second wells;
 - forming first and second doped regions both of the second type, respectively in the first and second wells and on both sides of the gate;
 - forming a third doped region of the first type in the first well and adjacent to the first doped region; and
 - forming a fourth lightly doped region of the second type adjacent to the first doped region and beneath the gate, wherein the fourth lightly doped region is shallower than the first doped region.*

(Emphasis Added).

According to MPEP 2143, to establish a prima facie case of obviousness, the prior reference (or references when combined) must teach or suggest all the claim limitations. As set forth above, Applicant respectfully asserts that Smayling and Beak do not teach or reasonably suggest at least the features/limitations that have been emphasized above in independent claims 1 and 15. Accordingly, Applicant respectfully asserts that the rejection of claims 1 and 15 is deficient and that these claims are in condition for allowance. Further, since dependent claims 2-3, 5, 7 and 8 incorporate the limitations of claim 1, and dependent claims 16-17, 19 and 21-22 incorporate the limitations of claim 15, Applicant respectfully assert that these claims also are in condition for allowance.

Newly Added Claims

Upon entry of the amendments in this response, Applicant has added claims 29 – 34 and respectfully asserts that these claims are in condition for allowance. In this regard, claim 29 recites:

29. A high voltage device comprising:
a substrate;
first and second wells respectively of a first type and a second type in the substrate;
a gate formed on a junction between the first and second wells, without a field oxide between the gate and the first and second wells;
first and second doped regions both of the second type, respectively formed in the first and second wells and on both sides of the gate;
a third doped region of the first type in the first well and adjacent to the first doped region; and
a fourth lightly doped region of the second type next to the first doped region and beneath the gate.

(Emphasis Added).

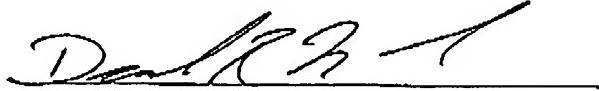
Applicant respectfully asserts that the cited references, either individually or in combination, are legally deficient for the purpose of rendering claim 29 unpatentable. Specifically, Applicant respectfully asserts that none of the references teaches or reasonably suggests at least the features/limitation emphasized above in claim 29. Therefore, Applicant respectfully asserts that claim 29 is in condition for allowance. Since claims 30 - 34 are dependent claims that incorporate the limitations of claim 29, Applicant respectfully asserts that these claims also are in condition for allowance.

CONCLUSION

In view of the foregoing, it is believed that all pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

No fee is believed to be due in connection with this amendment and response to Office Action. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

By: 
Daniel R. McClure
Registration No. 38,962

Thomas, Kayden, Horstemeyer & Risley, LLP
100 Galleria Pkwy, NW
Suite 1750
Atlanta, GA 30339
770-933-9500